

UNITED STATES ARMY RESEARCH LABORATORY
PROGRAM ANNOUNCEMENT (PA)
FOR THE
ARMY HIGH PERFORMANCE COMPUTING RESEARCH CENTER (AHPCRC)

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EXECUTIVE SUMMARY

1. **Background:** The Army High Performance Computing Research Program, hereinafter called “the Program.” Consists of two components: (1) a research component in computational sciences and engineering to be established as the Army High Performance Computing Research Center (AHPCRC); and (2) an infrastructure support component. This Program Announcement is for the establishment of the AHPCRC under this Program.

2. **Purpose:** Under this Program Announcement (PA), the U. S. Army Research Laboratory (ARL) solicits offers for the AHPCRC, that will help fulfill the research and development goals of the Department of Army by establishing a collaborative research environment including government and academic researchers. This PA covers three technical research areas related to computational sciences and engineering, which include: Interdisciplinary Computational Research (i.e. research involving more than one scientific discipline); Algorithms and Software Technology; and Enabling Technologies. Proposals in response to this PA shall provide for a research program to: 1) conduct innovative computational research in collaboration with Army scientists to accelerate the infusion of new technologies in support of Army Transformation; 2) provide for the mutual exchange of researchers between the Army and the recipient institution to facilitate the execution of joint research projects including the exploitation of high performance computing; and 3) provide on- and off-site symposia and educational programs to increase awareness of this partnership program, to foster scientific interchange, and to facilitate transition of new technologies emerging as a result of this program to Army laboratories and development centers. This PA will result in the award of a single Cooperative Agreement under the authority of 10 U. S. Code (USC) 2358, Research and Development Projects. Competition for the award is limited to academic institutions that meet the requirements set forth in PART III of this PA. Proposals in response to this PA shall include an HBCU/MI component or components, that meet the requirements set forth in PART III of the PA, and which collectively will receive at least 30% of the annual funded amount under this cooperative agreement. To ensure meaningful participation by all participating universities, the amount received by any individual participating university should not be less than 7.5% of the annual funded amount. The HBCU/MI participation shall also be meaningful in the management and leadership areas.

3. **Facilities and Equipment:** The Army and DoD have invested in High Performance Computing (HPC) resources located in Minneapolis, Minnesota, operated by Network Computing Services (NCS), Inc. as a part of the infrastructure support component of the Program. These resources are described in PART IV of this PA. Offerors are expected to integrate the use of these resources into their proposal.

4. **Eligible Participants:** The award made as a result of this PA is set-aside for U. S. academic institutions. At a minimum, the responsive offeror shall include at least one accredited, advanced degree (Ph. D.) granting educational institution noted for world-class research in interdisciplinary computational sciences, algorithms and software development, and enabling technologies. The quality and extent of HBCU/MI participation will be evaluated as set forth in PART IX of this PA. Offerors shall be capable

of providing the research described herein over a five-year period with an option for an additional three-year period. Additional information on eligible participants is set forth in PART III.

5. Period of Performance: The Cooperative Agreement awarded as a result of this Program Announcement is expected to provide for a basic performance period of five (5) years with one (1) optional three (3) year extension period, bringing the total performance period to a potential maximum of eight (8) years. The Government will assess the progress of the research effort yearly. Exercise of the three year option will be based on a comprehensive review of technical performance and approval by the Executive Advisory Board (see PART VI). Offerors are advised to submit proposals based on the projected funding levels described in the PA for the entire eight year effort. However, the Government expects the funding levels to fluctuate over the period of performance and envisions adjusting the program goals to coincide with these fluctuations through the Annual Program Plan (APP) process.

6. Profit or Fee: In accordance with DOD Grant and Agreement Regulations (DOD 3210.6-R), Cooperative Agreements awarded as a result of this Program Announcement will not provide for profit or fee.

7. Funding: Funding levels for the resultant cooperative agreements are identified in PART III of this Program Announcement. This Program Announcement is issued subject to the availability of funds. ARL has submitted the requisite documents to request continued funding for the eight-year period. However, offerors are reminded that this request is subject to Presidential, Congressional, and Departmental approval.

8. Proposal Submission: PART VIII of this Program Announcement provides information on Proposal Preparation and Submission. Note that there are page limitations and other requirements detailed in PART VIII. Proposals must be received by the ARL by **3:00 PM Eastern time on 29 June 2001** at the following addresses:

U.S. Army Robert Morris Acquisition Center
Research Triangle Park Division
ATTN: AMSSB-ACR (Patricia States)
4300 S. Miami Blvd.
Durham, NC 27703

Proposals received after the deadline will be handled in accordance with Attachment 1. Facsimile transmissions or electronic media transmissions are not permitted. Electronic media are allowed for the Cost Volume portion of the proposal only as specified in PART VIII.

9. Evaluation and Award: Evaluation and Award in connection with this Program Announcement will be performed in accordance with PART IX of this Program Announcement.

10. Amendments: Amendments to this Program Announcement will be released via the Internet on the ARL website (http://www.arl.army.mil/research_opps.htm). Offerors are encouraged to monitor the ARL web-site to ensure they have any and all amendments to the Program Announcement prior to submitting an offer.

11. Contact Information: All questions or comments concerning this Program Announcement shall be forwarded to one of the Points of Contact (POCs) identified below. Interested parties are encouraged to submit comments or questions via electronic mail to the e-mail address listed below. Comments or questions submitted should be concise and to the point, eliminating any unnecessary verbiage. In addition, the relevant part and paragraph of the Program Announcement should be referenced. ARL reserves the right to post questions of general interest to all offerors on the ARL web-site. The POCs are as follows:

Patricia J. States, Grants Officer

Phone: 919.549.4272, Fax: 919.549.4388

or

Richard Burkes, Agreement Specialist

Phone: 919.549.4295, Fax: 919.549.4388

E-MAIL ADDRESS: BurkesRC@arl.aro.army.mil

12. Acquisition Schedule: The following is an estimated schedule for the events leading to award under this Program Announcement:

<u>EVENT</u>	<u>ESTIMATED DATE/TIMEFRAME</u>
CBD Synopsis Issued	11 May 2001
Program Announcement Issued	15 May 2001
Proposals Due	29 June 2001
Negotiations Conducted	August 2001
Award	31 August 2001

PART I

U.S. ARMY MISSION AND VISION STATEMENTS

The mission of the U. S. Army is to fight and win our nations wars and to provide our National Command Authority with a broad range of options for regional engagement, crisis management, warfighting and peacetime operations. To attain this capability, the Army envisions a transformation in its fundamental structure from the predominantly heavy forces of today, to an Objective Force of technological superiority in the future with the characteristics of responsiveness, agility, deployability, versatility, lethality, survivability and sustainability. The cornerstone of this transformation for the Army embodying the Objective Force characteristics is the Future Combat Systems (FCS). The Army has reprogrammed most of its Science and Technology funding in order to develop the Objective Force platforms and equipment. Further discussion of the Army Vision may be found at the Army homepage: <http://www.army.mil>.

ARL's role in the Army transformation is to execute fundamental and applied research to provide the Army the key technologies and analytical support necessary to develop and deploy Future Combat Systems. ARL is a laboratory preeminent in key areas of science, engineering, and analysis relevant to land warfare; a staff widely recognized as outstanding; a laboratory seen by Army users as essential to their mission; and an intellectual crossroads for the technical community.

ARL operates as a unified entity at two major sites in Maryland (Aberdeen Proving Ground and Adelphi), with ancillary sites in White Sands, New Mexico; Hampton, Virginia; and Cleveland, Ohio and the Army Research Office in Research Triangle Park, North Carolina.

Although the Computational and Information Sciences Directorate of ARL is issuing this Program Announcement, it reflects the science and technology requirements of multiple U.S. Army laboratories and centers.

PART II

COMPUTATIONAL AND INFORMATION SCIENCES DIRECTORATE ROLE IN ARL

The U.S. Army Research Laboratory (ARL) Computational and Information Sciences Directorate (CISD) is a national scientific and engineering resource with an emphasis on computational technologies. Its mission is to use innovative computational and information science and technology to help shape the evolving future needs and capabilities of the Army Objective Force. The Directorate operates under four strategic pillars in order to execute its programs to support Army Science and Technology, Research, Development and Engineering Centers (RDECs) and Program Managers (PMs). These pillars include:

- **Battlefield Communications and Networks**
- **Data Fusion and Knowledge Management**
- **Battlespace Weather and Other Environmental Effects**
- **Computational Sciences and Engineering**

Under the Computational Sciences and Engineering pillar, the Directorate conducts a focused research and technology base program that advances the state-of-the-art in modeling, simulation and computer sciences related to efficient implementation on high performance, scalable architecture computing platforms. This effort provides the application scientists with advanced visualization, modeling and simulation tools and techniques to be able to perform a systematic evaluation of future and notional land warfare combat systems and expedite the acquisition process by encouraging maximum effective use of modeling and simulation with Army high performance computing assets in order to enhance the operational readiness of our land forces. In order to support the Computational Sciences and Engineering pillar, the Directorate executes research in the following areas:

- **Simulation in Support of Acquisition**
- **Scalable Programming Algorithms and Tools**
- **Relating Performance of Scalable Machines to Architecture and Application**
- **Scientific Visualization (Research associated with Remote and Immersive Visualization)**
- **Multi-disciplinary, Coupled Problem Challenges**
- **Numerical Analysis (Error Estimate and Propagation in large problems, better equation solvers for the parallel environment, etc.)**
- **Data Mining and Feature Extraction**
- **Metacomputing**
- **High Performance Networks and Information Assurance**

CISD plans and executes an interdisciplinary research and technology development program in Computational Structural Mechanics (CSM) and Integrated Modeling and Testing (IMT) within the scope and guidelines of the High Performance Computing Modernization Office (HPCMO) Common High Performance Computing Software Support Initiative (CHSSI) Program. Furthermore, the Directorate plans and directs a technology development effort in Programs, Environments and Training

(PET) as part of the ARL Major Shared Resource Center (MSRC) by providing the DOD HPC community with programming tools, techniques and environments for developing and enhancing application software for scalable architecture platforms; providing focus, coordination, and technical oversight for the Army High Performance Computing Research Program to ensure developed software is relevant and timely for Army materiel acquisitions; and interacting closely with Army Research Development and Engineering Centers (RDECs) and Program Managers (PMs), with other elements of DOD, other government agencies, industry and academia in cooperative ventures to foster rapid technology transition from our national technology base into Army acquisition and operational applications.

PART III

PROGRAM OVERVIEW

The function of the AHPCRC is to conduct fundamental research in computational methods and to develop novel solution techniques for applications of particular interest to the Army. This shall be accomplished in a number of ways, including research, visits to Army sites by faculty, post-docs and graduate students. Furthermore the AHPCRC will provide opportunities for the Army researchers to visit the recipient's facilities for extended periods.

The recipient of the cooperative agreement shall establish and implement a research program in high performance, large-scale scientific computing and novel computing environments in support of the Army's mission by instituting programs in

- Interdisciplinary Computational Research (*50% of the research effort);
- Algorithms and Software Technology (*20% of the research effort); and
- Enabling Technologies (*30% of the research effort).

(*For funding purposes, the breakdown of the proposed effort should follow the approximate percentage guidelines above.)

High performance computing techniques provide promising tools to accomplish a variety of Army acquisition and analysis missions. These missions may involve: the design of lethal and survivable weapon systems and platforms including research in materials; biomedical research; signature modeling; electromagnetics; lethality, protection and survivability of individual combatants; perception, cognition and assimilation in a task-oriented battle scenario; command, control and communications; information assurance; sensor systems, signal image processing and visualization; battle management and logistics; power and propulsion systems; chemical-biological research and environmental quality. Computational methods have emerged as indispensable and enabling tools for a broad spectrum of scientific, engineering and analysis problems that underlie many of these critical Army applications. The research to be conducted may require expertise in engineering, mathematics, physics, chemistry, computer science, biomedical engineering and behavioral sciences with impact on Army applications. The program must have scientific merit, contribute to strengthening of the U. S. defense posture, as well as contributing to U. S. competitiveness in high performance computing.

The recipient of the cooperative agreement is encouraged to perform collaborative research by incorporating Army scientists into the research program. Furthermore, to leverage the Army's investment in the AHPCRC under this cooperative agreement, the recipient is encouraged to contribute resources (e.g. funding, labor, facilities, etc.) in support of the research program.

Distribution of Funds.

The primary category of funding for this effort is 6.1, Basic Research. Basic Research efforts provide fundamental knowledge for the solution of identified military problems. It includes all effort of scientific study and experimentation directed toward increasing knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It provides farsighted, high payoff research, including critical enabling technologies that provide the basis for technological progress. It forms a part of the base for subsequent exploratory and advanced developments in defense-related technologies, and new and improved military functional capabilities in areas such as communications, detection, tracking, surveillance, propulsion, mobility, guidance and control, navigation, energy conversion, materials and structures, and personnel support. Basic research efforts precede and provide the basis for system specific research.

Funding under the 6.1 program is for research only and not for major HPC facilitization. In addition to the 6.1 funds, other fund types, subject to availability, may be provided as part of this agreement at the discretion of the government. These additional funds may be used for research, support, equipment, technology transfer and management activities. Also during the first year of this cooperative agreement, the infrastructure support contractor (NCS), will be funded at about \$1M to cover connectivity for the academic institutions included in this cooperative agreement to the Defense Research and Engineering Network (DREN), including gateways, routers, T-1 tail circuits, and some local scalable computing resources.

Funding levels for the resultant cooperative agreements identified in this Program Announcement are issued subject to the availability of funds. Offerors are reminded that this funding is subject to Presidential, Congressional, and Departmental approval. The total maximum value of the cooperative agreement to be awarded as a result of this PA is \$36M, which is \$4.5M per year for the eight year potential period of performance. Proposals submitted in response to this PA are to be based on this eight year potential period of performance at \$36M, with \$22.5M proposed for the basic period period of performance of 5 years, and \$13.5M proposed for the option for three additional years. Notwithstanding this agreement maximum value, the amount of baseline 6.1 funding expected for each FY is \$2M, with any additional funding being added as such funding becomes available.

Eligible Participants.

The award made as a result of this PA is set-aside for U. S. academic institutions. At a minimum, the responsive offeror shall include at least one accredited, advanced degree (Ph. D.) granting educational institution noted for world-class research in interdisciplinary computational sciences, algorithms and software development, and enabling technologies. At least 30% of the annual funded amount resulting from this cooperative agreement is set aside for HBCU/MIs. To ensure meaningful participation by all parties, the amount received by any individual participant will be no less than 7.5% of the annual funded amount. HBCU, as used in this PA, means institutions determined by the Secretary of Education to meet the requirements of 34 Code of Federal Regulations (CFR) Section 608.2. The term also means any nonprofit research institution that was an integral part of such a college or university

before November 14, 1986. MI, as used in this announcement, means institutions meeting the requirements of Section 1046(3) of the Higher Education Act of 1965 (20 U.S.C. 1135d-5(3)). The term also includes Hispanic-serving institutions as defined in section 316(b)(1) of such Act (20 U.S.C. 1059c(b)(1)). The quality and extent of the HBCU/MI participation will be evaluated as set forth in Part IX of this PA. The offerors shall be capable of providing the research described herein over a five-year period with an option for an additional three-year period.

PART IV

RESEARCH TOPIC AREAS

1. The paragraphs set forth below present the research topic areas for which the U.S. Army Research Laboratory (ARL) is seeking proposals. In order to be responsive to this PA an offeror's proposal must address all three research topic areas. Offerors are encouraged to propose multiple research projects across each topic area. Offerors are cautioned not to focus too narrowly on a single research project. Offerors are encouraged to consider the distribution of the research effort set out in Part III of this PA.

A. Interdisciplinary Computational Research. The recipient shall perform interdisciplinary research and technology generation in the broad areas of computational sciences and engineering utilizing scalable architecture computing platforms. These areas include, but are not limited to: signature modeling and mitigation to include computational chemistry and materials/coatings to control the absorption, reflectance, and emissions of electromagnetic and optical signals; radio frequency and thermal image modeling; computational fluid mechanics; modeling the electronic battlefield; signal image processing and computational structural mechanics. The research may involve basic studies and theoretical foundations and draw upon disciplines such as computer science, engineering, material science, applied mathematics and numerical analysis. Some of the areas of high pay-off over the next few years may include design of energetic materials for lethality applications with low vulnerability; computational design of nano-devices and MEMS technology; target and mine detection; intelligent data fusion; chemical/biological dispersion and multiphase flows including dispersion of aerosols; fluid-structure interactions, signature mitigation and low observable technologies, atmospheric science, environmental quality modeling, large deformations and penetrations for armor/anti-armor applications, dynamic response of materials, new and novel lethal mechanism and armor concepts, materials by design and the manufacture of various composite material components utilizing the best practices of concurrent engineering and simulations based design.

B. Algorithms and Software Technology. The recipient shall perform research to advance the state-of-the-art in algorithms and software technology that focuses on interdisciplinary applied research. The algorithms and software shall address effective and efficient solutions to time dependent, stiff differential equations for initial or boundary value problems on scalable, high performance computing architectures. The researchers shall pay particular attention to solution accuracy and execution time. Validated benchmark problem sets should be executed on multiple architectures. Example focus areas for such algorithms and software include: finite difference and finite element solutions to partial differential equations which govern physical behavior; numerical error propagation; contact formulations; interface formulations for interdisciplinary problems; boundary condition formulations; statistical and heuristic representation of human behavior.

C. Enabling Technologies. The recipient shall perform research in stand-alone enabling technologies as well as those that support the interdisciplinary research and algorithm and software technology. The focus shall be on well-chosen thrust for Army applications that involve mathematics

and computer science on scalable, high performance computing architectures. Examples include data mining for numerical, algorithmic, syntactic or textual context; meta-computing; graph partitioning in the various forms to include domain decomposition; geographical information systems analysis; target acquisition/identification; neural nets and fuzzy logic; various aspects of structured and unstructured grid generation for large-scale problems; scientific visualization of very large data sets; algorithm and software optimization and parallelization techniques on various scalable architectures.

2. Army Facilities Available for Collaborative Research.

a. Facilities Available under the Infrastructure Support Contract with Network Computing Services (NCS), Inc., Minneapolis, Minnesota.

The computational resources currently available as a result of the NCS Infrastructure Support contract shall be utilized as a primary computational resource. Through this cooperative agreement, 50 % of this computational capacity is available for use. These include a 1088 node SGI/Cray T3E-1200, SGI Power Challenges, Power Series and ONYX systems available in the graphics and visualization facility. The graphics and visualization facilities are connected to the T3E by FDDI and HIPPI fiber optic based networks. The SGI/Cray T3E-1200 and the visualization facilities are operated with centralized configuration management. These systems have the same operating policies, security policies, username structure, accounting procedures/reports, and systems administration philosophy. All systems support HPF, Fortran 90, MPI and a common debugger. Portability of applications from one system to another requires little or no re-programming effort or user retraining. Access to the systems is provided through user-generated scripts or a web-based interface. Computing systems are operated and available 24 hours per day, 365 days per year, less scheduled and unscheduled maintenance. Network and systems support staff are provided on-site and on-call to deal with issues expediently as they arise. Users are required to have successfully completed a National Agency Check (NAC). The infrastructure support site is connected to the Defense Research and Engineering Network (DREN) via a HPCMP provided DS-3 link and by dedicated T-1 links.

b. ARL Major Shared Resource Facilities at Aberdeen Proving Ground, Maryland.

As a secondary resource, the recipient is encouraged to utilize the computational resources provided at the ARL Major Shared Resource Center (MSRC), Aberdeen, MD, consisting of a variety of SGI, Cray, IBM and cluster platforms. A complete listing of the ARL MSRC resources and the policies for its use may be found at <http://www.hpcmo.hpc.mil/>.

PART V

INTERACTION WITH THE INFRASTRUCTURE SUPPORT CONTRACT

In order to facilitate the Army/university collaboration and technical support to the Army, the recipient will be expected to interact with the existing Infrastructure Support Contract currently being executed by Network Computing Services, Inc., Minneapolis, Minnesota, with a period of performance through 8 January 2003. The facilities and equipment supported and maintained by NCS are described in PART IV of this PA. The Infrastructure Support Contract interacts with the recipient of this cooperative agreement in the following manner, as specified in the Statement of Work (SOW) for the Contract:

1. The existing Infrastructure Support Contract supports the recipient of the AHPCRC by operating and maintaining the hardware and software described in PART IV. The purpose of the Infrastructure Support Contract is to ensure that the Army and AHPCRC users have continuing access to the resources of the Infrastructure Support HPC environment and to promote technology exchange and educational outreach. Specific support efforts include: (1) fostering accelerated technology exchange between academia, government and industry in the use of high performance computing technology, and (2) support, to the extent funded, the acquisition, operation, maintenance and use of high performance computing equipment either acquired under the cooperative agreement, or provided as Government Furnished Equipment (GFE), or made available through other arrangements.
2. The recipient shall utilize their educational and research capabilities to investigate areas in computing which are of special interest to the Army and to create an infrastructure for technology transfer and training. The recipient shall interact with certain Army sites for technology transfer and infrastructure support. These interactions shall take place at the recipient site and at the selected Army sites, as specified by the Contracting Officer's Representative (COR) for the Infrastructure Support Contract.
3. Research and Technology Exchange will occur through the Staff Scientists at Army Laboratories Program (SSALP) under the Infrastructure Support Contract. Under the SSALP, the infrastructure support contractor, assists the government in placing staff scientists at Army facilities. The staff scientists shall conduct training classes and tutorials in their respective computational technology areas of expertise. The recipient may provide input to the Government in the composition of the staff scientist positions so as to enhance the value of the program to the government on an annual basis. The composition of the staff scientist's skill levels and technical disciplines will be such as to directly complement the research content in the cooperative agreement. This is accomplished by mutual agreement between the Government and the Recipient.

PART VI

MANAGEMENT OF THE AHPCRC

The function of the AHPCRC is to conduct fundamental research in computational methods and to develop novel solution techniques for applications of particular interest to the Army. This shall be accomplished in a number of ways, including performing research and visits to Army sites by faculty, post-docs and graduate students. Furthermore, the AHPCRC will provide opportunities for Army researchers to visit AHPCRC facilities for extended periods. The following definitions set forth the framework for how the Government will work with the Recipient to manage the Army High Performance Computing Research Program, which consists of the AHPCRC and the Infrastructure Support Contract.

Executive Advisory Board (EAB): The EAB is chaired by the Department of the Army Director for Research and Laboratory Management, and includes the Director, ARL, representatives from other participating Army agencies (e.g., the Corps of Engineers, Medical Research and Materiel Command, AMC Research, Development and Engineering Centers), and selected Army staff elements (including the DUSA(OR) and the Small and Disadvantaged Business Utilization (SADBU) Office). The EAB will meet annually to review AHPCRC progress and plans and will be responsible for the decision regarding exercise of the three year option.

Policy Oversight Board (POB): A Policy Oversight Board is chaired by an Army designated POC from ARL and is comprised of the AHPCRC recipient, all AHPCRC sub-recipient universities at the level of Vice President/Dean; and the President for the Infrastructure Support Contractor. The POB provides for program coordination among the consortium members, and will meet annually or more often as necessary.

Research Advisory Committee (RAC): The Research Advisory Committee will be comprised of four representatives of the DOD selected by the government and three noted researchers from non-recipient universities selected by the Cooperative Agreement Manager (CAM) and the Director for the AHPCRC in consultation with the POB. The CAM will chair the RAC. The Director for the AHPCRC will be an ex-officio member of this committee. The role of the RAC is to provide periodic peer review of the on-going research program and to advise the CAM and the Director for the AHPCRC. The CAM will provide the RAC peer review written reports to the POB.

Director, AHPCRC: The Director of the AHPCRC is the lead Principal Investigator from the Recipient Organization.

Cooperative Agreement Manager (CAM): The CAM is the Army individual responsible for the management of the Cooperative Agreement awarded as a result of this PA. The CAM works closely with the director of the AHPCRC to prepare the Annual Program Plan (projects and budgets) and to review and monitor research program progress.

Annual Program Plan (APP): The APP serves as a base line document, which details the scope, schedule, budget and resource allocation/commitment for the research activities on an annual basis. The AHPCRC Director and CAM shall jointly prepare the APP and forward the consolidated plan to POB for review and consultation. After consultation with POB, and implementing any recommended changes, the CAM approves the plan. Once approved by the CAM and, executed by the ARL Grants Officer through the issuance of a Cooperative Agreement Modification, the APP/Budget constitutes the necessary "Statement of Work" and resource authorization document for each task to be undertaken.

Funding and Disbursement.

Timely disbursement of funds is important to the success of this program and shall be reflected as a critical part of the management plan. The offeror must submit a plan for tracking funding on a quarterly basis. The recipient of the cooperative agreement must invoice not less frequently than quarterly, and such invoices must be submitted within 30 days of the end of the quarter. Funding for the execution of this effort may be provided on a quarterly basis. In order to receive quarterly incremental funding, the recipient will be required to show that the invoices for the previous quarter have been submitted to the Government in a timely fashion. The Government reserves the right to decrement future incremental funding, if funding is not expensed on a timely basis. Further, the Recipient will have no longer than three months from the completion of the APP to ensure that all invoices are submitted in connection with that APP.

PART VII

COOPERATIVE AGREEMENT OVERVIEW

The Computational Sciences and Engineering Program is to be implemented through the use of a cooperative agreement. A cooperative agreement is generally shorter, simpler and less restrictive than a typical Government contract. Use of cooperative agreements by DoD elements are subject to the DoD Grant and Agreement Regulations (DoD 3210.6-R). The most recent version of the regulations can be found at <http://web7.whs.osd.mil/pdf/32106r/32106r.htm>. Offerors are advised to pay special attention to Appendix A to Part 22 of DoD 3210.6-R. Appendix A sets forth the required offeror certifications, suggested award provisions for national policy requirements, and the administrative requirements and issues to be addressed in award terms and conditions. Attachment 3 to this PA provides a model cooperative agreement.

PART VIII PROPOSAL PREPARATION AND SUBMISSION

This part is intended to provide information needed in preparing research proposals for submission to U.S. Army Research Laboratory (ARL).

A. General.

1. Proposals must be submitted according to the instructions contained herein. There will be NO electronic submission of proposals in connection with this Program Announcement. (However, see the proposal content instructions for the Cost Volume as some information concerning cost is requested in both hard copy and electronic media.)

2. Offerors shall submit their proposal(s) to the following addresses:

U.S. Army Materiel Command Acquisition Center
Research Triangle Park Division
ATTN: AMSSB-ACR (Patricia States)
4300 S. Miami Blvd.
Durham, NC 27703

3. Each proposal shall consist of the following:

Proposal Cover Sheet (Attachment No. 2)	Original and 1 copy
Technical/Management Volume (to include Program Summary** and biographical sketches)	Original and 10 copies
Cost Volume	Original and 5 copies (and 1 electronic copy)
Any exceptions, conditions, or comments	Original and 1 copy

** A brief program summary or abstract which summarizes the content of the technical portion of the proposal.

B. Technical/Management Volume .

Contents of the Technical/Management volume shall detail the proposed research program and proposed plan for program management. It must begin with a program summary of not more than one (1) page and explicitly address the evaluation criteria set forth in PART IX of this Program Announcement. All pages included in the Technical/Management Volume shall be numbered. **Offerors are advised that the Technical/Management Volume of the proposal shall not exceed**

60 pages, utilizing one side of the page. The 60 page maximum does not include biographical sketches for key personnel. Biographical sketches shall be limited to two (2) pages per person. Offerors are cautioned that pages in excess of the 60 page limitation, and pages in excess of the 2 page limitation for the Biographical Sketches, will not be included in the evaluation.

C. Cost Volume.

1. The cost portion of the proposal shall contain cost estimates sufficiently detailed for meaningful evaluation. For budget purposes, assume a performance start date of 1 August 2001. Budgets must be presented by cost elements as detailed in paragraph 2 below.

2. For the research program and plan for program management, the proposed amounts shall not exceed the funding ceilings identified for the total Research Program as identified in PART III of this Program Announcement. For the proposed research program and proposed plan for program management, the estimated costs must be broken down to show the following for all partner institutions:

- a. Direct labor categories, labor rates and labor hours associated with the effort.
- b. A general description and total estimated cost of expendable equipment and supplies.
- c. Contemplated expenditures for travel with brief explanation of purpose. Estimated costs should include destination, number of people, number of days, airfare, per diem and transportation. Travel must comply with general government guidelines (i.e, Joint Travel Regulations).
- d. Other direct costs (e.g., publications).
- e. Indirect rates and associated costs and the time frames to which they are applicable.
- f. A clear identification and explanation of any proposed cost-sharing costs and cost-sharing arrangement, to include the amount or ratio of cost share, when such cost share will be provided, and the evidence of a commitment from the offeror to provide such a cost share.

NOTE: Cost information is requested in hard copy and one copy in an electronic version. All spreadsheets submitted shall be compatible with Microsoft Office 97 Suite/Excel. (No hidden formulas are permitted.)

D. Administrative.

1. **Proposal Information.** The entire proposal should be concise, utilizing one side of the page with no fold-out pages. Each proposal must be typed (no type smaller than 11 point or 12 pitch on standard 8 1/2" X 11" paper with one (1) inch margins, 6 lines per inch).

2. **Bindings.** Proposals should be adequately bound in a manner which allows for ease in separation to facilitate the evaluation process. Separately bound volumes shall be submitted for the Technical/Management Volume and the Cost Volume.

3. **Marking of Proprietary Proposal Information.** The proposal submitted in response to this Program Announcement may contain technical and other data that the offeror does not want disclosed to the public or used by the Government for any purpose other than proposal evaluation. Information contained in unsuccessful proposals will remain the property of the offeror except for that evidenced in the Proposal Cover Sheet and Program Summary. The Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements.

If proprietary information which constitutes a trade secret, proprietary commercial or financial information, confidential personal information, or data affecting the national security, is provided by a offeror in a proposal, it will be treated in confidence, to the extent permitted by law, provided that the following legend appears and is completed on the front of the proposal:

For any purpose other than to evaluate the proposal, this data except for that contained in the Proposal Cover Sheet and Program Summary shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if an award is made to the offeror as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use or disclose the data to the extent provided in the cooperative agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction is contained in page(s) _____ of this proposal.

Any other legend may be unacceptable to the Government and may constitute grounds for removing the proposal from further consideration and without assuming any liability for inadvertent disclosure. The Government will limit dissemination of properly marked information to within official channels.

In addition, the pages indicated on the proposal cover sheet as restricted must be marked with the following legend:

Use or disclosure of the proposal data on pages specifically identified by asterisk (*) are subject to the restriction on the cover page of this proposal.

The Government assumes no liability for disclosure or use of unmarked data and may use or disclose such data for any purpose.

In the event properly marked data contained in a proposal in response to this Program Announcement is requested pursuant to the Freedom of Information Act, 5 USC 552, the offeror will

be advised of such request and prior to such release of information will be requested to expeditiously submit to ARL a detailed listing of all information in the proposal which the offeror believes to be exempt from disclosure under the Act. Such action and cooperation on the part of the offeror will ensure that any information released by ARL pursuant to the Act is properly determined.

PART IX PROPOSAL EVALUATION

1. General

All information necessary for the review and evaluation of a proposal must be contained in the technical/management and cost volumes of the proposal. No other material will be provided to the evaluators. Each proposal will be evaluated based on the merit and relevance of the specific research proposed as it relates to the PA requirements.

An initial review of the proposals will be conducted to ensure compliance with the requirements of this Program Announcement (PA). Failure to comply with the requirements of the PA may result in a proposal receiving no further consideration for award.

A Technical Evaluation Committee (TEC) will review the proposals. The TEC, consisting of qualified groups of scientists, managers, and cost specialists, will conduct a detailed review of each proposal and provide an analysis to the Selecting Official (SO).

The Army, at its discretion, may visit proposed sites during the evaluation phase to verify information contained in the proposals. Any site visits will be coordinated with the offerors at the appropriate time.

2. Evaluation Factors

Proposals submitted in response to this Program Announcement will be evaluated using the following evaluation factors:

1. Overall Technical Quality – Interdisciplinary Computational Research
2. Overall Technical Quality – Algorithms and Software Technology
3. Overall Technical Quality – Enabling Technologies
4. HBCU/MI Participation
5. Management
6. Cost

The first five factors will be evaluated using adjectives and colors in accordance with the evaluation plan. Cost will be evaluated for realism, reasonableness, and affordability. Evaluators will identify strengths, weaknesses, clarifications, and deficiencies concerning proposals submitted.

3. Evaluation Criteria –

Factors 1, 2 and 3 – Overall Technical Quality

Evaluations of these three factors include the technical quality of the proposed research program; the relevance of the proposed research program to the Army research and technology development to enhance the lethality and survivability of the individual soldier and advanced weapon systems; and the qualifications of key personnel involved in the proposed effort. For Factor 1, these elements will be reviewed in the context of proposed Interdisciplinary Computational Research; similarly for Factor 2 (Algorithms and Software Technology) and Factor 3 (Enabling Technologies). Technical quality will concentrate on the overall scientific and technical merit of the proposed research in light of the state-of-the-art of current related technologies. Thus, the proposal should include a complete technical discussion stating the background and objectives of the proposed research, the approaches to be considered, and the level of effort to be employed. Evaluation of the relevance to the Army will focus on how well the proposed research responds to the Army Vision and the Army's requirements to achieve that Vision. The Army Vision may be found at the Army homepage: <http://www.army.mil>. Thus, the proposal should include a discussion of how the proposed research relates to, and supports, the Army Vision. The successful offeror will be expected to become acquainted with systems and concepts associated with Army Transformation, particularly the Future Combat Systems and other Objective Force concepts. Evaluations of qualifications of the technical staff will review the capabilities, availability, and experience of both the offeror's and sub-recipient's research personnel, their relevant past accomplishments, and their ability to achieve the proposed technical objectives. The proposal should include the names and brief biographies of the key personnel for all members who will be involved in the research. Such credentials shall include, among others, a record of seminal publications in the scientific literature by the academic partners, and a record of successful past program deliverables and transitions.

Factor 4 - HBCU/MI Participation.

Evaluation of this factor will involve determination whether planned funding allocation meets the minimum criteria defined earlier (i.e., 7.5% for any individual participant and 30% for HBCU/MIs overall) and assessment of the extent to which HBCU/MI partners are involved in leadership roles, management decision, and quality research efforts, as well as the extent to which the HBCU/MI's research efforts will be integrated into the overall research efforts of the program. The proposal should clearly indicate how this will be accomplished.

Factor 5 - Management

The management portion of the proposal will be evaluated for a clear management plan, a plan for tracking resources, and collaborative efforts. The management evaluation will assess the adequacy of the overall management (business) plan, internal team structure and composition with respect to achieving the technical goals of the program, including the management approach for developing, approving and modifying the Annual Program Plan in cooperation with the CAM. The plan for tracking

resources will assess the persistence of management attention to programmatic, technical, financial and administrative matters and the ability of the recipient to effectively track resources and objectives and to be able to highlight potential problems for management's attention. The evaluators will pay particular attention to the guidelines set forth in the **Funding and Disbursements** section of PART VI. Finally, the management portion of the proposal will be evaluated as to how well the offeror utilizes elements of the Infrastructure Support Contract to establish and maintain a collaborative environment by leveraging personnel exchanges, workshops, symposia, technology transfer, and exploit the synergistic potential of the program by collaborating with both ARL researchers and researchers from other government agencies.

Factor 6 – COST

This area will not be scored. Evaluation of this area will consider cost realism, cost reasonableness, and affordability within funding constraints.

4. Relative Importance of Evaluation Factors

Factor 1 is worth approximately twice as much as Factors 2 and 3. Factors 4 and 5 are less important than 1, but more important than 2 or 3.

5. Basis of Award

The award will be based on an integrated assessment of each offeror's ability to satisfy the solicitation requirements. The government anticipates that the award may be made without discussions; however, the government reserves the right to conduct discussions. If discussions are held, a competitive range will be established such that any such discussions will be held only with offerors whose proposals were determined to have a reasonable chance of receiving an award. If discussions are held, offerors in the competitive range will be invited to submit Final Proposal Revisions, which will be evaluated using the same evaluation procedures as were used with the initial proposals. The Government will make an award to the offeror conforming to the solicitation that offers the best value to the government, cost and other factors considered. Furthermore, the award may be made to other than the offeror(s) who offers the lowest cost proposals or to other than the best technical proposals.

ATTACHMENT 1 LATE SUBMISSIONS

LATE SUBMISSIONS, MODIFICATIONS, AND WITHDRAWALS OF PROPOSALS

(a) Any proposal received at the U.S. Army Research Laboratory after the exact time specified for receipt will not be considered unless it is received before award is made and it--

(1) Was sent by registered or certified mail not later than the fifth calendar day before the date specified for receipt of offers (e.g., an offer submitted in response to a solicitation requiring receipt of offers by the 15th of the month must have been mailed by the 10th);

(2) Was sent by mail and it is determined by the Government that the late receipt was due solely to mishandling by the Government after receipt at the Government installation;

(3) Was sent by U.S. Postal Service Express Mail Next Day Service-Post Office to Addressee, not later than 5:00 p.m. at the place of mailing two working days prior to the date specified for receipt of proposals. The term "working days" excludes weekends and U.S. Federal holidays; or

(4) Is the only proposal received.

(b) Any modification of a proposal or quotation is subject to the same conditions as in subparagraphs (a)(1), (2), and (3) of this provision.

(c) The only acceptable evidence to establish the date of mailing of a late proposal or modification sent either by U.S. Postal Service registered or certified mail is the U.S. or Canadian Postal Service postmark both on the envelope or wrapper and on the original receipt from the U.S. or Canadian Postal Service. Both postmarks must show a legible date or the proposal, quotation, or modification shall be processed as if mailed late. "Postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed by employees of the U.S. or Canadian Postal Service on the date of mailing. Therefore, offerors or quoters should request the postal clerk to place a legible hand cancellation bull's eye postmark on both the receipt and the envelope or wrapper.

ATTACHMENT 1 (Cont.)

(d) The only acceptable evidence to establish the time of receipt at the Government installation is the time/date stamp of that installation on the proposal wrapper or other documentary evidence of receipt maintained by the installation.

(e) The only acceptable evidence to establish the date of mailing of a late offer, modification, or withdrawal sent by Express Mail Next Day Service-Post Office to Addressee is the date entered by the post office receiving clerk on the "Express Mail Next Day Service-Post Office to Addressee" and the postmark on both the envelope or wrapper and on the original receipt from the U.S. Postal Service. "Postmark" has the same meaning as defined in paragraph (c) of this provision, excluding postmarks of the Canadian Postal Service. Therefore, offerors should request the postal clerk to place a legible hand cancellation bull's eye postmark on both the receipt and the envelope or wrapper.

(f) Notwithstanding paragraph (a) of this provision, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government will be considered at any time it is received and may be accepted.

(g) Proposals may be withdrawn by written notice or telegram (including mailgram) received at any time before award. Proposals may be withdrawn in person by an offeror or an authorized representative, if the representative's identity is made known and the representative signs a receipt for the proposal before award.

ATTACHMENT 2
PROPOSAL COVER SHEET
(to be completed and submitted with proposal)

A PROPOSAL SUBMITTED TO THE U. S. ARMY RESEARCH LABORATORY FOR
THE ARMY HIGH PERFORMANCE COMPUTING RESEARCH CENTER (AHPCRC)

PROPOSAL AMOUNT BASIC (5 YEARS):
PROPOSAL AMOUNT OPTION (3 YEARS):

NAME AND ADDRESS OF ORGANIZATION:

TECHNICAL POC (PROPOSED AHPCRC CENTER DIRECTOR)
FOR ORGANIZATION:

PHONE, FAX AND EMAIL FOR TECHNICAL POC:

BUSINESS POC FOR ORGANIZATION:

PHONE, FAX AND EMAIL FOR BUSINESS POC:

POC FOR ORGANIZATION CONCERNING COST PROPOSAL:

PHONE, FAX AND EMAIL FOR COST PROPOSAL POC:

LISTING OF THE NAMES OF ALL ORGANIZATIONS INCLUDED IN THE PROPOSAL (i.e. the recipient and all sub-recipients and subcontractors); WHETHER THESE ORGANIZATIONS ARE HBCU/MIs or ADVANCED DEGREE GRANTING EDUCATIONAL INSTITUTIONSs; and THE PERCENTAGE OF INVOLVEMENT PROPOSED BASED UPON THE AMOUNT PROPOSED FOR THAT ORGANIZATION AS COMPARED TO THE TOTAL PROPOSED AMOUNT:

IDENTIFICATION OF ANY RESOURCE CONTRIBUTIONS PROPOSED INCLUDING THE NAME OF THE ORGANIZATION PROPOSING SUCH; THE PROPOSED AMOUNT

(VALUE) OF THE CONTRIBUTION; AND THE NATURE OF THE CONTRIBUTION (e.g. cash, labor, equipment, facilities, etc.):

SIGNATURE OF PERSON AUTHORIZED TO SUBMIT THE PROPOSAL AND BIND THE ORGANIZATION:

TYPED NAME AND TITLE OF PERSON SIGNING THE PROPOSAL:

DATE THE PROPOSAL IS SIGNED:

ATTACHMENT 3 TO THE AHPCRC PROGRAM ANNOUNCEMENT

**ARMY HIGH PERFORMANCE COMPUTING RESEARCH CENTER (AHPCRC)
MODEL COOPERATIVE AGREEMENT**

COOPERATIVE AGREEMENT

BETWEEN

(The Recipient)

AND

U.S. Army Research Laboratory

CONCERNING

The Army High Performance Computing Research Center (AHPCRC)

Agreement No:

Total Estimated Amount of the Agreement: (Exclusive of Option)

Total Estimated Government Funding of the Agreement: (Exclusive of Option)

Government Funds Obligated:

Total Estimated Cost Share Provided by Recipient: (If Applicable) (Exclusive of Option)

Total Estimated Amount of the Option:

Total Estimated Government Funding of the Option:

Total Estimated Cost Share Provided by Recipient for the Option:

Authority: 10 U.S.C. 2358

Accounting and Appropriation Data:

ACRN AA:

(1) Appropriation No

(2) Requisition No.:

The Recipient, to be paid, must submit a Payment Information Form (Standard Form SF-3881) to the responsible DoD payment office, if that payment office does not currently have the information (e.g., bank name and account number) needed to pay the Recipient by EFT.

This Agreement is entered into between the United States of America, hereinafter called the Government, represented by the *Army Research Laboratory (ARL)*, and _____, pursuant to and under U.S. Federal Law.

FOR RECIPIENT

FOR THE UNITED STATES OF AMERICA
U.S. ARMY ROBERT MORRIS
ACQUISITION CENTER

(Signature)

(Signature)

Patricia J. States, Grants Officer

Pstates@arl.army.mil

(Name, Title)

Effective Date: _____

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ARTICLE 1 Scope of the Agreement

1.1 Introduction

This Agreement is a “Cooperative Agreement” (31 USC 6305) and is awarded pursuant to 10 USC 2358 Research Projects. The Parties agree that the principal purpose of this Agreement is for _____, hereinafter referred to as the “Recipient”, to provide its best research efforts in the support and stimulation of basic research and not the acquisition of property for the direct benefit or use of the Government. FAR and DFARS apply only as specifically referenced herein. The Grants Officer represents, warrants and assures the other party to this Agreement that this is not a procurement contract or grant agreement under 31 USC Sections 6303 and 6304 for the purposes of FAR Section 31.205-18(a) and that such other party’s IR&D cost incurred in performance under this Agreement are not construed to be sponsored by, or required in performance of a procurement contract or grant agreement. This Agreement is not intended to be, nor shall it be construed as, by implication or otherwise, a partnership, a corporation, or other business organization.

1.2 Background and Vision Statement (Subject to Negotiation)

1.3 Scope (Broadly defined scope of work specific to individual awards)

1.4 Goals/Objectives (Specific goals and objectives that result from negotiations)

ARTICLE 2 General Definitions

2.1 Recipient -- An organization or other entity receiving a grant or cooperative agreement from a DoD Component. For purposes of this Agreement, the Recipient is _____.

2.2 Party -- For purposes of this Agreement, the parties are ARL and the Recipient.

2.3 Cooperative Agreement Manager (CAM) -- Is the Government's technical representative from ARL charged with the overall responsibility of management and guidance of the cooperative agreement.

2.4 Grants Officer -- Is the Government's principal point of contact for all administrative, financial or other non-technical issues arising under the Agreement.

2.5 Research Milestones -- Are performance goals collaboratively developed by the Government and the Recipient as a part of the annual program planning process. Accomplishment of research milestones shall be reflected in quarterly technical status reports and shall be used by the CAM as a metric to monitor the Recipient’s use of best efforts towards attaining the research objectives.

2.6 Basic Research – Basic research efforts provide fundamental knowledge for the Solution of identified military problems. Includes all effort of scientific study and experimentation directed toward increasing knowledge and understanding in those fields of the physical, engineering, environmental, and life sciences related to long-term national security needs. It provides farsighted, high-payoff research, including critical enabling technologies that provide the basis for technological progress. It forms part of the base for (a) subsequent exploratory and advanced developments in Defense related technologies, and (b) new and improved military functional capabilities in areas such as communications, detection, tracking, surveillance, navigation, energy

conversion, materials and structures, and personnel support. Basic research efforts precede the system specific research described in DoDD 5000.1.

2.7 Budget Plan -- Is the financial expression of the project or program as approved during the award process. It shall include the sum of both Federal and non-Federal shares, as appropriate.

2.8 Cost Share -- That effort provided by the Recipient in excess of the effort funded with Federal funds.

ARTICLE 3 Program Management

3.1 Executive Advisory Board (EAB): The EAB is chaired by the Department of the Army Director for Research and Laboratory Management, and includes the Director, ARL, representatives from other participating Army agencies (e.g., the Corps of Engineers, Medical Research and Materiel Command, AMC Research, Development and Engineering Centers), and selected Army staff elements (including the DUSA(OR) and the Small and Disadvantaged Business Utilization (SADBU) Office). The EAB will meet annually to review AHPCRC progress and plans and will be responsible for the decision regarding exercise of the three year option.

3.2 Policy Oversight Board (POB): A Policy Oversight Board is chaired by an Army designated POC from ARL and is comprised of the AHPCRC recipient, all AHPCRC sub-recipient universities at the level of Vice President/Dean; and the President for the Infrastructure Support Contractor. The POB provides for program coordination among the consortium members, and will meet annually or more often as necessary.

3.3 Research Advisory Committee (RAC): The Research Advisory Committee will be comprised of four representatives of the DOD selected by the government and three noted researchers from non-recipient universities selected by the Cooperative Agreement Manager (CAM) and the Director for the AHPCRC in consultation with the POB. The CAM will chair the RAC. The Director for the AHPCRC will be an ex-officio member of this committee. The role of the RAC is to provide periodic peer review of the on-going research program and to advise the CAM and the Director for the AHPCRC. The CAM will provide the RAC peer review written reports to the POB.

3.4 Director, AHPCRC: The Director of the AHPCRC is the lead Principal Investigator from the Recipient Organization.

3.5 Cooperative Agreement Manager (CAM): The CAM is the Army individual responsible for the management of the Cooperative Agreement awarded as a result of this PA. The CAM works closely with the director of the AHPCRC to prepare the Annual Program Plan (projects and budgets) and to review and monitor research program progress.

3.6 Annual Program Plan (APP): The APP provides a detailed plan of research activities (including key personnel, facilities, allocation of resources and research milestones) and commits the recipient to use its best efforts to meet specific research objectives. The APP is jointly developed by the CAM and AHPCRC Director.

3.7 Annual Program Planning Process. Within 30 days the AHPCRC Director and CAM shall jointly prepare the Annual Program Plan (APP) for year 1 (date of award through 12 months) and forward the consolidated plan to POB for review and consultation. After consultation with POB, and implementing any recommended changes, the CAM approves the plan.

Once approved, the APP shall serve as the annual baseline document which details the scope, schedule, principal investigator(s), staff rotation, educational opportunities, and resource allocation/commitment of the consortium research activities. The APP shall include a list of foreign nationals proposed to perform during the period. This list shall be updated as necessary during the course of performance. The ARL Grants Officer, in conjunction with the ARL CAM, will approve the APP by way of issuing a modification to this agreement. The modification will incorporate the APP and budget to this agreement. The APP will then constitute the necessary “statement of work” and authorization document for each task included in the APP.

Beginning 6 months after initial award, the Annual Program Planning Process shall begin for the following year. This process shall continue for the length of the Agreement. The ARL CAM or his representatives will have the right to make visits as needed during the year to assess or coordinate performance.

During the course of performance, if it appears that research milestones will not be met, the RPM will provide a proposed adjustment to the APP for approval by the ARL CAM. In addition, the ARL CAM may from time to time request that additional research be added to the APP. The Recipient will provide an annual written report on the progress and results of the APP research.

The ARL CAM, in coordination with the RPM, will be responsible for integrating the APP with the overall ARL research and technology program.

ARTICLE 4 Staff Rotation

4.1 Staff Rotation. A foundation of the Collaborative Alliances in Technology process is the rotation of private and public sector research personnel through short and long term, temporary assignments among the Alliance and consortium members. This staff rotation will be undertaken to foster and facilitate collaborative research where face-to-face interaction is required, to enable a researcher to utilize unique facilities, and to facilitate the exchange of research results. In addition, this exchange, or cross training, of personnel will provide Alliance personnel with insight into Army-unique requirements and will provide Government personnel with insight into commercial practices or the opportunity to pursue basic research with noted practitioners.

4.2 Salary and Travel Costs. All salary and travel costs associated with the rotation of government personnel will be borne by the Government. All salary and travel costs associated with staff rotation of consortium personnel will be borne by the consortium by way of funding provided under this agreement.

4.3 Host Facility Regulations. All personnel in rotational assignments are required to comply with the safety, environmental, security, and operational regulations or requirements of the host facility.

4.3 Administrative Support. The host facility will provide adequate office space, communications connections, administrative support, and office supplies, if available, for researchers in long-term rotational assignments. Should it become necessary to procure equipment to facilitate a rotational assignment, the APP should reflect the need for said equipment, and the costs will be borne under the cooperative agreement.

ARTICLE 5 Fiscal Management

5.1 Allocation of Recipient Funds

5.1.1 Restrictions on the Use of Government Funds. Government funds provided under this Agreement must be allocated by the Recipient exclusively for the execution and operation of the APP or

Agreement Scope. Government funds shall not be utilized to support the Recipient's operations or administration unrelated to this Agreement.

5.1.2 Obligation. In no case shall the Government's financial obligation exceed the amount obligated on this Agreement or by amendment to the Agreement. The total amount estimated for performance of the initial ____ months of effort of this Cooperative Agreement is \$_____. Of this amount, the Governments share is \$_____ and the Recipients share is \$_____. The amount of Government funds available for payment is \$_____. It is estimated that such funds shall be sufficient to cover performance through _____ months from date of agreement award. The Government is not obligated to reimburse the Recipient for expenditures in excess of the amount of obligated funds allotted by the Government.

5.1.3 Incremental Funding. The Government may obligate funds to this Agreement incrementally. In the event that this Agreement is funded incrementally, the Government anticipates that from time to time additional amounts will be allotted to this agreement by unilateral modification, until the total amount for performance of this Agreement has been funded. To minimize interruption of effort due to lack of funds, the Recipient shall notify the Grants Officer in writing whenever the amount of funds obligated under this agreement when added to anticipated costs in the next 60 days will exceed 75% of the amount allotted.

5.1.4 Cost Share. (If Applicable) The Recipient contributions for the purpose of cost share may consist of both cash and in-kind contributions. All in-kind contributions must comply with the requirements of 32 CFR 34.13 Cost Sharing or Matching. The Government and Recipient estimate that the Scope of this agreement (exclusive of the option) can only be accomplished with a total aggregate resource contribution of \$_____ from the effective date of this agreement through ____ months thereafter. The Recipient intends, and by entering into this agreement, undertakes to cause these funds to be provided. The Recipient's contributions will be provided as detailed in Attachment _____. For the purposes of this agreement, the cost share ratio shall be \$_____ Government and \$_____ Recipient. . The Government and Recipient estimate that the Scope of the Option can only be accomplished with a total aggregate resource contribution of \$_____ from the effective date of this agreement through ____ months thereafter. The Recipient intends, and by entering into this agreement, undertakes to cause these funds to be provided. The Recipient's contributions will be provided as detailed in Attachment _____. For the purposes of this option, the cost share ratio shall be \$_____ Government and \$_____ Recipient Failure of either party to provide its contribution may result in termination of this agreement, in accordance with Paragraph 7.4(a) of this agreement, or a proportional reduction in funding.

5.1.5 Payments

a. The Recipient shall submit an original and two (2) copies of all vouchers (SF 270 "Request for Advance or Reimbursement") to the Agreement Administrator for payment approval. After written verification of progress towards or achievement of the research milestones by the CAM, and approval by the Agreement Administrator, the vouchers will be forwarded to the payment office within ten (10) calendar days of receipt of the voucher. Payments will be made via EFT by the Payment Office listed in Article 8 within 30 calendar days of receipt of transmittal.

b. Payments will be made no more frequently than monthly and will be based on reimbursement of actual expenditures as monitored against the Budget Plan contained in the APP. Once the CAM has verified that the Recipient has expended best efforts towards the successful achievement of the research goals, payment will be authorized.

5.1.5 Mandatory Information for Electronic Funds Transfer Payment (AUG 1996)

a. Method of payment. Payments by the Government under this agreement, including invoice and agreement financing payments, may be made by check or electronic funds transfer (EFT) at the option of the Government. If payment is made by EFT, the Government may, at its option, also forward the associated payment information by electronic transfer. As used in this clause, the term "EFT" refers to the funds transfer and may also include the information transfer.

b. Mandatory submission of Recipient's EFT information. (1) The Recipient is required, as a condition to any payment under this agreement, to provide the Government with the information required to make payment by EFT as described in paragraph d of this clause, unless the payment office determines that submission of the information is not required. For any payments to be made after January 1, 1999, the Recipient shall provide EFT information as described in paragraph d of this clause.

c. Recipient's EFT information. Prior to submission of the first request for payment under this agreement, the Recipient shall provide the information required to make agreement payment by EFT, as described in paragraph d of this clause, directly to the Government payment office named in this agreement. If more than one payment office is named for the agreement, the Recipient shall provide a separate notice to each office. In the event that the EFT information changes, the Recipient shall be responsible for providing the changed information to the designated payment office(s).

d. Required EFT information. The government may make payment by EFT through either an Automated Clearing House (ACH) subject to the banking laws of the United States or the Federal Reserve Wire Transfer System at the Government's option. The Recipient shall provide the following information for both methods in a form acceptable to the designated payment office. The Recipient may supply this data for this or multiple agreements (see paragraph b of this clause).

(1) The agreement number to which this notice applies.

(2) The Recipient's name and remittance address, as stated in the Agreement, and account number at the Recipient's financial agent.

(3) The signature (manual or electronic, as appropriate), title, and telephone number of the Recipient official authorized to provide this information.

(4) For ACH payments only:

(i) Name, address, and 9-digit Routing Transit Number of the Recipient's financial agent.

(ii) Recipient's account number and the type of account (checking, saving, or lockbox).

(5) For Federal Reserve Wire Transfer System payments only:

(i) Name, address, telegraphic abbreviation, and the 9-digit Routing Transit Number for the Recipient's financial agent.

(ii) If the Recipient's financial agent is not directly on-line to the Federal Reserve Wire Transfer System and, therefore, not the receiver of the wire transfer payment, the Recipient shall also provide the name, address and 9-digit Routing Transit Number of the correspondent financial institution receiving the wire transfer payment.

e. Suspension of payment. (1) Notwithstanding the provisions of any other paragraph of this agreement, the Government is not required to make any payment under this agreement until after receipt, by the designated payment office, of the correct EFT payment information from the Recipient or a certificate submitted in accordance with

paragraph b of this clause. Until receipt of the correct EFT information, any payment request shall be deemed not to be a valid payment request..

(2) If the EFT information changes after submission of correct EFT information, the Government shall begin using the changed EFT information no later than the 30th day after its receipt to the extent payment is made by EFT. However, the Recipient may request that no further payments be made until the changed EFT information is implemented by the payment office. If such suspension would result in a late payment under the provisions of this agreement, the Recipient's request for suspension shall extend the due date for payment by the number of days of the suspension.

f. Recipient EFT arrangements. The Recipient shall designate single financial agent capable of receiving and processing the electronic funds transfer using the EFT methods described in paragraph d of this clause. The Recipient shall pay all fees and charges for receipt and processing of transfers.

g. Liability for uncompleted or erroneous transfers. (1) If an uncompleted or erroneous transfer occurs because the Government failed to use the Recipient-provided EFT information in the correct manner, the Government remains responsible for (i) making a correct payment, (ii) paying any prompt payment penalty due, and (iii) recovering any erroneously directed funds.

(2) If an uncompleted or erroneous transfer occurs because Recipient-provided EFT information was incorrect at the time of Government release of the EFT payment transaction instruction to the Federal Reserve System, and --

(i) If the funds are no longer under the control of the payment office, the Government is deemed to have made payment and the Recipient is responsible for recovery of any erroneously directed funds; or

(ii) If the funds remain under the control of the payment office, the Government retains the right to either make payment by mail or suspend the payment in accordance with paragraph d of this clause.

h. EFT and prompt payment. (1) A payment shall be deemed to have been made in a timely manner in accordance with the provisions of this agreement if, in the EFT payment transaction instruction given to the Federal Reserve System, the date specified for settlement of the payment is on or before the prompt payment due date, provided the specified payment date is a valid date under the rules of the Federal Reserve System.

(2) When payment cannot be made by EFT because of incorrect EFT information provided by the Recipient, no interest penalty is due after the date of the uncompleted or erroneous payment transaction, provided that notice of the defective EFT information is issued to the Recipient within 7 days after the Government is notified of the defective EFT information.

i. Payment office discretion. If the Recipient does not wish to receive payment by EFT methods for one or more payments, the Recipient may submit a request to the designated payment office to refrain from requiring EFT information or using the EFT payment method. The decision to grant the request is solely that of the Government.

j. Change of EFT information by financial agent. The Recipient agrees that the Recipient's financial agent may notify the Government of a change to the routing transit number, Recipient account number, or account type. The Government shall use the changed data in accordance with paragraph e(2) of this clause. The Recipient agrees that the information provided by the agent is deemed to be correct information as if it were provided by the Recipient. The Recipient agrees that the agent's notice of changed EFT data is deemed to be a request by the Recipient in accordance with paragraph e(2) that no further payments be made until the changed EFT information is implemented by the payment office.

5.2 Audit Procedures. The Recipient shall ensure that an audit of all activities under this Agreement shall be conducted annually in accordance with the following subparagraphs and 32 CFR 32.26 or 32 CFR 34.16 as applicable. Copies of all audit reports shall be provided to the Agreements Administration Office.

5.2.1. Selection of Auditors, Scope of Audit, and Audit Objectives. An independent auditor, herein defined as a public accountant or government auditor who meets the standards specified in the Government Auditing Standards issued by the U.S. Comptroller General, shall review and report Recipient expenditures of federal funds. The auditor shall determine whether: (1) The financial statements of the Recipient present fairly its financial position and the results of its operations in accordance with generally accepted accounting principles; (2) The Recipient has an internal control structure to provide reasonable assurance that it is managing Federal awards in compliance with applicable laws and regulations, and has in place adequate controls to ensure compliance with the laws and regulations that could have a material impact on the financial statements; (3) The Recipient has complied with laws and regulations that may have a direct and material effect on its financial statement and amounts on each major Federal program; (4) The Recipient is operating in compliance with its established policies and procedures; and (5) The Recipient has complied with all requirements of this Agreement.

5.2.2 Records. The Recipient shall maintain adequate records to account for Federal funds received, as well as cost share elements, under this Agreement. Upon completion or termination, whichever occurs earlier, the Recipient shall furnish to the Agreement Administrator a copy of the final financial report prepared in accordance with Attachment 5. The Recipient's relevant financial records are subject to examination or audit by the Government for a period not to exceed three (3) years after expiration of the term of this Agreement. The Agreement Administrator or designee shall have direct access to sufficient records and information of the Recipient, to ensure full accountability for all funding under this Agreement. Upon prior written notice such audit, examination, or access shall be performed during business hours on business days and shall be subject to the security requirements of the audited party.

ARTICLE 6 Agreement Administration

6.1 Modifications to this Agreement. Any Party who wishes to modify this Agreement shall, upon reasonable notice of the proposed modification to the other Party, confer in good faith with the other Party to determine the desirability of the proposed modification. Modifications shall not be effective until a written modification is signed by the Agreement signatories or their successors. Administrative modifications may be unilaterally executed by the Grants Officer or by the Agreements Administrator.

6.2 Requirements for Approval for Changes to the Program Budget and Annual Program Plan. This provision highlights Agency decisions on the terms and conditions of 32 CFR 32.25. During the course of performance, the Grants Officer, in coordination with the CAM, will have approval authority for certain specific changes to the APP including but not limited to:

- a. Changes in the scope or the objective of the program, APP, or research milestones;
- b. Change in the key personnel specified in the proposal or award document;
- c. The absence for more than three months, or a 25% reduction in time devoted to the project, by the approved project director or principal investigator.
- d. The need for additional Federal funding.

- e. The transfer of amounts budgeted for indirect costs to absorb increases in direct costs, or vice versa.

ARTICLE 7 Term of the Agreement, Suspension, and Termination

7.1 Term of the Agreement. The basic term of this Agreement shall commence upon the effective date and continue for 60 months. This agreement also has a three-year option provision that the Government may exercise unilaterally. The following provisions and 32 CFR 32.61 and 32.62 address the suspension and termination of this agreement.

7.2 Exercising the Optional Period of Performance. The Government will assess the progress of the research effort annually. At the conclusion of the fourth-year of the basic period of performance, the Government will perform a comprehensive review of the research program. Should the review conclude that the program has been successful and that continued success is assured, the Government will notify the consortium of their intention to exercise the option and extend the period of performance for an additional three-years. The option will be formally exercised by way of a modification to the cooperative agreement issued by the Grants Officer.

7.3 No-Cost Period of Performance Extension. In accordance with the DoD Grant and Agreement Regulations (DoD 3210.6-R), the consortium may initiate a request for a one-time, no-cost extension to the period of performance. The request may not include additional Federal funds, nor change the approved objectives or scope of the program.

7.4 Suspension or Termination for Failure to Comply. If the Recipient materially fails to comply with the terms and conditions of the agreement, the Grants Officer may, after having given Recipient thirty (30) days written notice of failure, take one or more of the following actions as appropriate:

- a. Temporarily withhold payments pending correction of the deficiency by the Recipient, or more severe enforcement action as deemed appropriate by the Grants Officer, or DoD Component;
- b. Disallow all or part of the cost of the activity or action not in compliance;
- c. Wholly or partly suspend or terminate the current agreement;
- d. Withhold further awards for the project or program;
- e. Take any other legally available remedies.

7.5 Termination. This Cooperative Agreement may be terminated in whole or in part by:

- a. the Grants Officer if a Recipient materially fails to comply with the terms and conditions of the Agreement and the breach is not cured within thirty (30) days after receipt of written notice of said breach;
- b. the Grants Officer should insufficient funds be available to accomplish the goals or intent of the agreement, or other convenience of the Government;
- c. the Grants Officer with the consent of the Recipient, in which case the parties shall agree upon the termination conditions, including the effective date and, in the case of partial termination, the portion to be terminated;
- d. by the Recipient, upon sending to the Grants Officer written notification setting forth the reasons for such termination, the effective date and, in the case of partial termination, the portion to be terminated. The Recipient

must provide such notice at least 30 days prior to the effective date of the termination. If the Grants Officer determines in the case of partial termination that the reduced or modified portion of the cooperative agreement will not accomplish the purposes for which the award was made, the Grants Officer may terminate the agreement in its entirety.

7.5 Costs Incurred During Suspension or Termination. Costs of the Recipient resulting from obligations incurred by the Recipient during a suspension or after termination of the agreement are not allowable unless the Grants Officer expressly authorizes them in either the notice of suspension or termination, or subsequently. Other Recipient costs incurred during suspension or termination which are necessary and not reasonably avoidable are allowable if:

a. The costs result from obligations which were properly incurred by the Recipient before the effective date of the suspension or termination, are not in anticipation of it, and in the case of termination, are non-cancelable; and

c. the costs would be allowable if the agreement were not suspended or the award expired normally at the end of the funding period in which the termination takes effect.

ARTICLE 8 Administrative Responsibility

8.1 The Agreements Office

Grants Officer:

Agreement Specialist:

8.2 The Agreements Administration Office

8.3 The Recipient Address and Point of Contact

8.4 The Payment Office

8.5 Address of Payee

ARTICLE 9 Public Release or Dissemination of Information

9.1 Open Publication Policy. Notwithstanding the reporting requirements of this Agreement, parties to this Agreement favor an open-publication policy to promote the commercial acceptance of the technology developed under this Agreement, but simultaneously recognize the necessity to protect proprietary information.

9.2 Prior Review of Public Releases. (subject to negotiation based on the process proposed)

ARTICLE 10 Patent Rights

10.1 Definitions

10.1.1 *Invention* means any invention or discovery which is or may be patentable or

Otherwise protectable under Title 35 of the United States Code, or any novel variety of plant which is or may be protected under the Plant Variety Act (7 U.S.C. 2321 et seq.).

10.1.2 *Subject invention* means any invention of the recipient conceived or first actually reduced to practice in the performance of work under this agreement, provided that in the case of a variety of plant, the date of determination (as defined in section 41(d) of the Plant Variety Protection Act 7 U.S.C. 2401(d)) must occur during the period of agreement performance.

10.1.3 *Practical application* means to manufacture in the case of a composition or product, to practice in the case of a machine or system; and, in the case, under such conditions as to establish that the invention is being utilized and that its benefits are, to the extent permitted by law or government regulations, available to the public on reasonable terms.

10.1.4 *Made* when used in relation to any invention means the conception or first actual reduction to practice of such invention.

10.1.5 *Small Business Firm* means a small business concern as defined at Section 2 of Public Law 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration. For the purpose of this clause, the size standards for small business concerns involved in Government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, will be used.

10.1.6 *Nonprofit Organization* means a university or other institution of higher education Or an organization of the type described in section 501©(3) of the Internal Revenue Code of 1954 (26 U.S.C. 501(c) and exempt from taxation under section 501(a) of the Internal Revenue Code (25 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute.

10.2 Allocation of Principal Rights. The recipient may retain the entire right, title, And interest throughout the world to each subject invention subject to the provisions of this clause and 35 U.S.C. 203. With respect to any subject invention in which the recipient retains title, the federal government shall have a nonexclusive, nontransferrable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world.

10.3 Invention Disclosure, Election of Title and Filing of Patent Application by Recipient

10.3.1 The recipient will disclose each subject invention to ARL within two months after the inventor discloses it in writing to recipient personnel responsible for patent matters. The disclosure to the agency shall be in the form of a written report and shall identify the agreement under which the invention was made and the inventor(s). Is shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological or electrical characteristics of the invention. The disclosure shall also identify any publication, sale or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to ARL, the recipient will promptly notify ARL of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the recipient.

10.3.2 The recipient will elect in writing whether or not to retain title to any such invention by notifying ARL within two years of disclosure to ARL. However, in any case where publication, sale or public use has initiated the one year statutory period wherein valid patent protection can still be obtained in the United States, the period for election of title may be shortened by ARL to a date that is no more than 60 days prior to the end of the statutory period.

10.3.3 The recipient will file its initial patent application on a subject invention to which it elects to retain title within one year after election of title or, if earlier, prior to the end of any statutory period wherein valid patent protection can be obtained in the United States after publication, on sale, or public use. The recipient will file patent applications in additional countries or international patent offices within either ten months of the corresponding initial patent application or six months from the date permission is granted by the Commissioner of patents and trademarks to file foreign patent applications where such filing has been prohibited by a Secrecy Order.

10.3.4 Request for extension of the time for disclosure, election, and filing under Subparagraphs (1), (2), and (3) may, at the discretion of ARL, be granted.

10.4 Conditions When the Government May Obtain Title. The recipient will convey title to ARL, upon written request, title to any subject invention

10.4.1 If the recipient fails to disclose or elect title to the subject invention within the times specified in 10.3 above, or elects not to retain title; provided that ARL may only request title within 60 days after learning of the failure of the recipient to disclose or elect within the specified times.

10.4.2 In those countries in which the recipient fails to file patent applications within the times specified in 10.3 above; provided, however, that if the recipient has filed a patent application in a country after the times specified in 10.3 above, but prior to its receipt of the written request of ARL, the recipient shall continue to retain title in that country.

10.4.3 In any country in which the recipient decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceeding on, in a patent on a subject invention.

10.5 Minimum Rights to the Recipient and Protection of the Recipient Right to File

10.5.1 The recipient will retain a nonexclusive royalty-free license throughout the world in each subject invention to which the Government obtains title, except if the recipient fails to disclose the invention within the times specified in 10.3, above. The recipient's license extends to its domestic subsidiary and affiliates, if any, within the corporate structure of which the recipient is a party and includes the right to grant sublicenses of the same scope to the extent the recipient was legally obligated to do so at the time the agreement was awarded. The license is transferable only with the approval of ARL except when transferred to the successor of that party of the recipient's business to which the invention pertains.

10.5.2 The recipient's domestic license may be revoked or modified by ARL to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted in accordance with application provisions at 37 CFR part 404 and Agency licensing regulations (if any). This license will not be revoked **in that** field of use or the geographical areas in which the recipient has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of the funding Federal agency to the extent the recipient, its licensees, or the domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

10.5.3 Before revocation or modification of the license, the funding Federal agency will furnish the recipient a written notice of its intention to revoke or modify the license, and the recipient will be allowed thirty days (or such other time as may be authorized by the funding Federal agency for good cause shown by the recipient) after the notice to show cause why the license should not be revoked or modified. The recipient has the right to appeal, in accordance with applicable regulations in 37 CFR part 404 and Agency regulations (if any)

concerning the licensing of Government-owned inventions, any decision concerning the revocation or modification of the license.

10.6 Recipient Action to Protect the Government's Interest

10.6.1 The recipient agrees to execute or to have executed and promptly deliver to the Federal agency all instruments necessary to (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the recipient elects to retain title, and (ii) convey title to the Federal agency when requested under paragraph 10.4 above and to enable the Government to obtain patent protection throughout the world in that subject invention.

10.6.2 The recipient agrees to require by written agreement, its employees, other than clerical and non technical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the recipient each subject invention made under agreement in order that the recipient can comply with the disclosure provisions of paragraph 10.3 above, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. This disclosure format should require as a minimum, the information required by 10.3.1 above. The recipient shall instruct such employees through employee agreements or other suitable educational programs on the importance of the reporting inventions in sufficient time to permit filing of patent applications prior to U.S or foreign statutory bars.

10.6.3 The recipient will notify the Federal agency of any decision not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than thirty days before the expiration of the response period required by the relevant patent office.

10.6.4 The recipient agrees to include, within the specification of any United States patent applications and any patent issuing thereon covering a subject invention, the following statement, "This invention was made with Government support under (identify the agreement) awarded by (identify the Federal agency). The Government has certain rights in the invention.

10.7 Subcontracts

10.7.1 The recipient will include this clause, suitably modified to identify the parties, in all subcontracts, regardless of tier, for experimental, developmental or research work to be performed by a small business firm or domestic nonprofit organization. The subcontractor will retain all rights provided for the recipient in this clause, and the recipient will not, as part of the consideration for awarding the subcontract, obtain rights in the subcontractor's subject invention.

10.7.2 The recipient will include in all other subcontracts, regardless of tier, for experimental, developmental, or research work the patent rights clause required by FAR 52-227.11.

10.8 Reporting on Utilization of Subject Inventions. The recipient agrees to submit on request periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the recipient or its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the recipient, and such other data and information as the agency may reasonably specify. The recipient also agrees to provide additional reports as may be requested by the agency in connection with any march-in proceeding undertaken by the agency in accordance with paragraph 10.10 of this clause. As required by 35 U.S.C. 202(c)(5), the agency agrees it will not disclose such information to persons outside the Government without permission of the recipient.

10.9 Preference for United States Industry. Notwithstanding any other provision of this

clause, the recipient agrees neither it nor any assignee will grant to any person the exclusive right to use or sell any subject inventions in the United States unless such person agrees that any products embodying the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by the Federal agency upon a showing by the recipient or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

10.10 March-in Rights. The recipient agrees that with respect to any subject invention in which it has acquired title, the federal agency has the right in accordance with the procedures in 37 CFR 401.6 and any supplemental regulations of the Agency to require the recipient, an assignee or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the recipient, assignee, or exclusive licensee refuses such a request the Federal agency has the right to grant such a license itself if the Federal agency determines that:

10.10.1 Such action is necessary because the recipient or assignee has not taken or is not expected to take within reasonable time, effective steps to achieve practical application of the subject invention in such field of use.

10.10.2 Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the recipient, assignee, or licensee.

10.10.3 Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the recipient, assignee, or licensee; or

10.10.4 Such action is necessary because the agreement required by paragraph 10.9 of this clause has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such agreement.

10.11 Special Provisions for Agreements with Nonprofit Organizations. If the recipient is a nonprofit organization it agrees that:

10.11.1 Rights to a subject invention in the United States may not be assigned without the approval of the Federal agency, except where such assignment is made to an organization which has as one of its primary functions the management of inventions, provided that such assignee will be subject to the same provisions as the recipient.

10.11.2 The recipient will share royalties collected on a subject invention with the inventor, including Federal employee co-inventors (when the Agency deems it appropriate) when the subject invention is assigned in accordance with 35 U.S.C. 202(e) and 37 CFR 401.10;

10.11.3 The balance of any royalties or income earned by the recipient with respect to subject inventions, after payment of expenses (including payments to inventors) incidental to the administration of subject inventions, will be utilized for the support of scientific research or education; and

10.11.4 It will make efforts that are reasonable under the circumstances to attract licensees of subject inventions that are small business firms and that it will give a preference to a small business firm when licensing a subject invention if the recipient determines that the small business firm has a plan or proposal for marketing the invention which, if executed, is equally as likely to bring the invention to practical application as any plans or proposals from applicants that are not small business firms; provided, that the recipient is also satisfied that the small business firm has the capability and resources to carry out its plan or proposal. The decision whether to give a preference in any specific case will be at the discretion of the recipient of the recipient. However, the recipient

agrees that the Secretary may review the recipient's licensing program and decisions regarding small business applicants, and the recipient will negotiate changes to its licensing policy, procedures, or practices with the Secretary when the Secretary's review discloses that the recipient could take reasonable steps to implement more effectively the requirements of this paragraph 10.11.4.

10.12 Communication. Reports and notifications required by this clause shall be forwarded to the Grants Officer identified in this agreement.

ARTICLE 11 Rights in Technical Data

11.1 Definitions

11.1.1 Technical Data -- Means recorded information, regardless of the form or method of the recording, of a scientific or technical nature (including computer software documentation). The term does not include data or computer software documentation incidental to contract administration, such as financial and/or management information.

11.1.2 Computer Program -- Means a set of instructions, rules, or routines, recorded in a form that is capable of causing a computer to perform a specific operation or series of operations.

11.1.3 Computer Software -- Means computer programs, source code, source code listings, object code listings, design details, algorithms, processes, flow charts, formulae, and related material that would enable the software to be reproduced, recreated, or recompiled.

11.1.4 Computer Software Documentation -- Means owner's manuals, user's manuals, installation instructions, operating instructions, and other similar items regardless of storage medium that explain the capabilities of the computer software or provide instructions for using the software.

11.1.5 Proprietary Information -- Means information that embodies trade secrets developed at private expense or information which is confidential business or financial information provided that such information:

- a. is not generally known or available from other sources without obligations concerning its confidentiality;
- b. has not been made available by the owners to others without obligation concerning its confidentiality; and
- c. is not already available to the Government without obligation concerning its confidentiality.

11.2 Rights in Technical Data and Computer Software

11.2.1 Technical Data and Computer Software First Created Under This Cooperative Agreement. Technical data and computer software first created by Recipient under this Agreement will be disclosed to the Government. The Government shall have the right to use, modify, reproduce, release, perform, display or disclose such technical data and computer software for any Government purpose and to authorize such rights to others for like purposes. A Government purpose is any activity to which the United States Government is a party including competitive procurement, but not including commercial activity.

11.2.2 Background Technical Data and Computer Software. In the event it is necessary for the Recipient to provide to the Government background technical data or computer software created prior to or outside the scope of this Agreement, and such background technical data or computer software is identified with suitable proprietary notice or legend, the Government shall use best efforts to maintain such background technical data or computer software in confidence and will not disclose said background technical data or computer software to others without the written permission of Recipient.

11.2.3 Technical Data and Computer Software Available Without Restrictions. The Government shall have the right to use, modify, reproduce, release, perform, display or disclose in whole or in part, in any manner and for any purpose whatsoever, and to authorize others to do so, all technical data and computer software that:

- a. are or have been publicly available;
- b. have been released or disclosed by the Recipient without restrictions on further use, release, or disclosure;
- c. have been provided to the Government with unlimited rights under a Government contract, grant, cooperative agreement, cooperative research and development agreement, or through a specific license.

11.3 Oral and Visual Information. If information which the Recipient considers to be proprietary is disclosed orally or visually to Government personnel, such information MUST be reduced to tangible recorded form, identified with suitable notice or legend and furnished to the Government within thirty (30) days after such oral or visual disclosure, otherwise the Government shall have no duty to restrict or protect such information from further disclosure.

11.4 Lower Tier Agreements. The Recipient shall include this Article (*Rights in Technical Data*), suitably modified to identify the parties, in all subcontracts, subaward, or lower tier agreements, regardless of tier, for experimental, development or research work.

ARTICLE 12 Entire Agreement

This Agreement along with all Attachments constitutes the entire agreement between the parties concerning the subject matter hereof and supersedes any prior understandings or written or oral agreement relative to said matter. In the event of a conflict between the terms of the Agreement and its attachments, the terms of the Agreement shall govern.

ARTICLE 13 Governing Law/Order of Precedence

The Agreement shall be enforced in accordance with applicable federal law and regulations, directives, circulars or other guidance as specified in this Agreement. When signed, this Agreement shall become binding on the Recipient and the Government to be administered in accordance with the DoD Grant and Agreement Regulations as they apply to the particular recipient or subrecipient concerned. In the event a conflict exists between the provisions of this Agreement and the applicable law, regulations, directives, circulars or other guidance, the Agreement provisions are subordinate.

ARTICLE 14 Waiver of Rights

Any waiver of any requirement contained in this Agreement shall be by mutual agreement of the parties hereto. Any waiver shall be reduced to writing and a copy of the waiver shall be provided to each Party. Failure to insist upon strict performance of any of the terms and conditions hereof, or failure or delay to exercise any rights provided herein or by law, shall not be deemed a waiver of any rights of any Party hereto.

ARTICLE 15 Organizational Conflict of Interest

Performance under this Agreement may create the appearance of bias or of unfair competitive advantage for the Recipient. In order to avoid the appearance of any such organizational conflicts of interest, certain tasks may restrict the Recipient or any of its related organizations from competing for or receiving certain future contracts. When such tasks are included in the APP, the specific restrictions will be included. These tasks will be limited to the preparation of a Statement of Work or involvement in the evaluation of technical proposals. Recipient reserves the right to decline to accept particular tasks which will restrict the Recipient or any of its related organizations from competing for or receiving subsequent contracts.

ARTICLE 16 Use of Technical Facilities

To the maximum extent practical, the Recipient agrees to use the technical reference facilities of the Defense Technical Information Center, 8725 John J. Kingman Road, Suite 0944, Ft. Belvoir, VA 22060-6218 (Internet address: <http://www.dtic.mil>) and all other sources, whether United States Government or private, for purpose of surveying existing knowledge and avoiding needless duplication of scientific and engineering effort.

ARTICLE 17 Metric System of Measurement

The Metric Conversion Act of 1975 as amended by the Omnibus Trade and Competitiveness Act of 1988 and implemented by Executive Order 12770 gives preference to the metric system. The Recipient shall ensure that the metric system is used to the maximum extent practicable in performance of this Agreement.

ARTICLE 18 Liability

No Party to this Agreement shall be liable to any other Party for any property of that other Party consumed, damaged, or destroyed in the performance of this Agreement, unless it is due to the negligence or misconduct of the Party or an employee or agent of the Party.

ARTICLE 19 Non-Assignment

This Agreement may not be assigned by any Party except by operation of law resulting from the merger of a party into or with another corporate entity.

ARTICLE 20 Severability

If any clause, provision or section of this Agreement shall be held illegal or invalid by any court, the invalidity of such clause, provision or section shall not affect any of the remaining clauses, provisions or sections herein and this Agreement shall be construed and enforced as if such illegal or invalid clause, provision or section had not been contained herein.

ARTICLE 21 Force Majeure

Neither Party shall be in breach of this Agreement for any failure of performance caused by any event beyond its reasonable control and not caused by the fault or negligence of that Party. In the event such a force majeure event occurs, the Party unable to perform shall promptly notify the other Party and shall in good faith

maintain such partial performance as is reasonably possible and shall resume full performance as soon as is reasonably possible.

ARTICLE 22 Notices

All notices and prior approvals required hereunder shall be in writing and shall be addressed to the parties identified on the Agreement cover page and Article 8. Notices shall be effective upon signature of the Grants Officer.

ARTICLE 23 Foreign Travel

In accordance with OMB cost principles applicable to the Recipient, each foreign trip requires prior approval from the Grants Officer. If the Recipient travels outside CONUS in performance of the Agreement, the requirements of the Foreign Clearance Guide (DODD 4500.54-G) must be met.

ARTICLE 24 Printing Costs

In accordance with OMB Circular A-122, Attachment B, paragraph 37e and consistent with the Recipient's obligation to publish and otherwise disseminate and deploy research results, the Recipient is hereby authorized to include publication and printing costs related to projects funded under the Agreement as allowable direct costs.

ARTICLE 25 Performance by Foreign Nationals

In accordance with 8 USC 1324a, it is unlawful to hire for employment in the U.S. an individual without verifying that individual's employment authorization. 8 CFR 274a.2 VERIFICATION OF EMPLOYMENT ELIGIBILITY identifies the official documents, which establish employment eligibility. As part of the APP process, consortium members shall separately identify foreign nationals who are expected to perform under this agreement during the period of performance. Should the foreign national's performance require access to DoD facilities, the employer shall coordinate with the sponsor providing access, in order to submit the following:

1. Individual's Name
2. Citizenship
3. Date and Location of the Visit
4. Purpose of the Visit
5. Passport Number
6. Employer's Verification of Work Authorization

ATTACHMENT 1 Standard Terms and Conditions for Institutions of Higher Education, Hospitals, and Other Non-Profit Organizations

Department of Defense Grant and Agreement Regulations (DoDGARS)

(32 CFR Parts 21-34)

Standard Terms and Conditions

The following references are to provisions of the DoDGAR that are applicable to the institutions of higher education, hospitals, and other non-profit organizations that are recipients of this agreement. Narratives following a reference indicate the Agency's decision on specific issues.

32 CFR 22.815 Claims, Disputes and Appeal

The Agency and Recipient will employ Alternative Dispute Resolution to resolve issues which arise during the performance of the agreement. The procedures to be used will be mutually agreed to when and if issues arise (see section 815(c)(2)). The Grant Appeal Authority is the Director of ARL (see section 815(e)(i)).

32 CFR 32.21 Standards for Financial Management Systems

ARL does not guarantee or insure the repayment of money borrowed by the recipient. Further, ARL does not require the recipient to secure fidelity bond coverage to protect the Government's interests.

32 CFR 32.22 Payment

All payments made under this agreement will be of the reimbursement type. Recipients should refer to Article 5 Fiscal Management of this agreement for further information.

32 CFR 32.27 and 32.28 Allowable Costs

32 CFR 32.23 Cost Share or Match

This provision is applicable only if cost share or match is included in the recipient's proposal and the subsequent award document. The resultant award document will specify allowable types of cost share.

32 CFR 32.24 Program Income

Should this agreement result in generating program income, the recipient shall account for said funds, add them to the funds committed to the project, and they shall be used to further the program objectives. The recipient shall have no obligation to the Government for program income earned after the expiration of this Agreement. Costs incident to the generation of program income may be deducted from gross income to determine program income, provided these costs have not been charged to the award document. The Patent and Trademark Amendments (35 U.S.C. Chapter 18) apply to inventions made under this award.

32 CFR 32.25 Revision of Budget/Program Plans

See Article 6 of this agreement.

32 CFR 32.26 Audit

Non-Profit entities shall submit a copy of the OMB Circular A-133 audit reports to the DoD Inspector General.

32 CFR 32.40 through 32.49 Procurement

ARL reserves the right to review prior to award procurement documents such as request for proposals, or invitations for bids, independent cost estimates etc., during performance under this award.

32 CFR 32.5 Subawards

This subpart sets forth the requirement for flow down provisions or subsequent sub-agreements or sub-awards.

32 CFR 32.30 through 32.37 Property

ARL reserves the right to transfer title to any and all equipment or exempt property purchased under this agreement to the Federal Government or to eligible third parties upon conclusion of this agreement.

ARL waives the requirement for recordation of liens or other appropriate notices set forth at 32 CFR 32.37.

Recipients are subject to applicable regulations governing patents and inventions, including Governmentwide regulations issued by the Department of Commerce at 37 CFR part 401 “Rights to Inventions Made by Nonprofit Organizations and Small Business Firms Under Government Grants, Contracts and Cooperative Agreements.”

ARL does not waive the right to obtain, reproduce, publish or otherwise use the data first produced under this award or to authorize others to receive, reproduce, publish, or otherwise use such data for government purposes.

32 CFR 32.51 and 32.52 Reports

See Attachment 5 of this agreement.

32 CFR 32.53 Records

32 CFR 32.71 through 32.73 After-the-Award Requirements

ATTACHMENT 2 National Policy Requirements

National Policy Requirements

By signing this Agreement or accepting funds under this Agreement, the recipient assures that it will comply with applicable provisions of the national policies on the following topics:

1. Nondiscrimination

- a. On the basis of race, color, or national origin, in Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d, et seq.), as implemented by DoD regulations at 32 CFR part 195.
- b. On the basis of sex or blindness, in Title IX of the Education Amendments of 1972 (20 U.S.C. 1681, et seq.).
(Applicable to Educational Institutions only)
- c. On the basis of age, in the Age Discrimination Act of 1975 (42 U.S.C. 6101, et seq.), as implemented by Department of Health and Human Services regulations at 45 CFR part 90.
- d. On the basis of handicap, in Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. 794), as implemented by Department of Justice regulations at 28 CFR part 41 and DoD regulations at 32 CFR part 56.

2. Live Organisms. For human subjects, the Common Federal Policy for the Protection of Human Subjects, codified by the Department of Health and Human Services at 45 CFR part 46 and implemented by the Department of Defense at 32 CFR part 219.

3. Environmental Standards.

a. Comply with the applicable provisions of the Clean Air Act (42 U.S.C. 7401, et. Seq.) and Clean Water Act (33 U.S.C. 1251, et. seq.), as implemented by Executive Order 11783 [3 CFR, 1971-1075 Comp., p. 799] and Environmental Protection Agency (EPA) rules at 40 CFR part 15. In accordance with the EPA rules, the Recipient further agrees that it will:

- Not use any facility on the EPA's List of Violating Facilities in performing any award that is nonexempt under 40 CFR 15.5, as long as the facility remains on the list.

- Notify the awarding agency if it intends to use a facility in performing this award that is on the List of Violating Facilities or that the Recipient knows has been recommended to be placed on the List of Violating Facilities.

b. Identify to the awarding agency any impact this award may have on the quality of the human environment, and provide help the agency may need to comply with the National Environmental Policy Act (NEPA, at 42 U.S.C. 4231, et. seq.) and to prepare Environmental Impact Statements or other required environmental documentation. In such cases, the recipient agrees to take no action that will have an adverse environmental impact (e.g., physical disturbance of a site such as breaking of ground) until the agency provides written notification of compliance with the environmental impact analysis process.

4. Officials Not to Benefit. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Agreement or to any benefit arising from it, in accordance with 41 U.S.C. 22.

5. Preference for U.S. Flag Carriers. Travel supported by U.S. Government funds under this Agreement shall use U.S. -flag air carriers (air carriers holding certificates under 49 USC 41102) for international air transportation of people and property to the extent that such service is available, in accordance with the International Air Transportation Fair Competitive Practices Act of 1974 (49 USC 40118) and the interpretative guidelines issued by

the Comptroller General of the United States in the March 31, 1981, amendment to the Comptroller General Decision B138942.

6. Cargo Preference. The recipient agrees that it will comply with the Cargo Preference Act of 1954 (46 U.S.C. 1241), as implemented by Department of Transportation regulations at 46 CFR 381.7, which require that at least 50 percent of equipment, materials or commodities procured or otherwise obtained with U.S. Government funds under this agreement, and which may be transported by ocean vessel, shall be transported on privately owned U.S.-flag commercial vessels, if available.

7. Military Recruiters. As a condition for receipt of funds available to the Department of Defense (DoD) under this award, the recipient agrees that it is not an institution of higher education (as defined in 32 CFR part 216) that has a policy of denying, and that it is not an institution of higher education that effectively prevents, the Secretary of Defense from obtaining for military recruiting purposes: (A) entry to campuses or access to students on campuses; or (B) access to directory information pertaining to students. If the recipient is determined, using the procedures in 32 CFR part 216, to be such an institution of higher education during the period of performance of this agreement, and therefore to be in breach of this clause, the Government will cease all payments of DoD funds under this agreement and all other DoD grants and cooperative agreements to the recipient, and it may suspend or terminate such grants and agreements unilaterally for material failure to comply with the terms and conditions of award.

ATTACHMENT 3 Other Certifications

Other Certifications

The following Certifications, which have been executed by the Recipient prior to award of this Agreement are on file with the issuing office, and are hereby incorporated herein by reference:

- a. Certification at Appendix A to 32 CFR Part 28 Regarding Lobbying
- b. Certification at Appendix A to 32 CFR Part 25 Regarding Debarment, Suspension, and Other Responsibility Matters
- c. Certification at Appendix C to 32 CFR Part 25 Regarding Drug-Free Workplace Requirements

ATTACHMENT 4 Annual Program Plan and Budget

(to be completed at time of award)

ATTACHMENT 5 Reporting Requirements

REPORTING REQUIREMENTS

A. MONTHLY HBCU/MI REPORT

The Recipient shall provide a monthly accounting evidencing the distribution of funds provided under this agreement to the consortium HBCU/MI members.

B. QUARTERLY REPORT

Throughout the term of the Agreement, the Recipient shall submit or otherwise provide a quarterly report (government fiscal quarter). Two (2) copies shall be submitted or otherwise provided to the CAM, and one (1) copy shall be submitted or otherwise provided to the Agreements Administration Office. A copy of the letter of transmittal shall be submitted or otherwise provided to the Agreements Office. The report shall contain two (2) major sections:

1. Technical Status Report. The technical status report will detail technical progress to date on research milestones, all problems, technical issues or major developments during the reporting period. The technical status report will include a report on the status of the collaborative activities during the reporting period. The technical status report will include the utilization of subject inventions by the Recipient.
2. Joint Papers and Presentations. When determined necessary by the CAM periodic joint papers and presentations will be given
2. Business Status Report. The business status report will provide summarized details of the resource status of this Agreement, including the status of contributions by the Recipient. This report will identify the status for all organizations involved in the Agreement (i.e. the recipient and each sub-recipient and subcontract.) This report should compare the resource status with any payment and expenditure schedules or plans provided in the original agreement. Any major deviations shall be explained along with discussion of adjustment actions proposed.

C. JOURNAL ARTICLES

Journal articles in general and joint ARL/Recipient journal articles are strongly encouraged as a major reporting mechanism of this research effort.

D. ANNUAL REPORT

1. The Recipient shall submit an Annual Report making full disclosure of all major technical developments and progress for the preceding 12 months of effort within sixty (60) calendar days of completion of the effort and for each additional 12 months of effort, through the life of this agreement. (insert specifics of reports requirements). The report will also provide an accounting of all Federal funds expended during the term of the Agreement. With the approval of the Cooperative Agreement Manager, reprints of published articles may be attached to the Final Report.

ACQUISITION SENSITIVE

2. The Recipient shall make distribution of the Final report as follows: Cooperative Agreement Manager - 1 original plus 1 copy; Agreement Administration Office - 1 copy, and the Grants Officer - 1 copy of the letter of transmittal only. In addition, one (1) copy of the Final Report shall be provided to Defense Technical Information Center (DTIC) addressed to 8725 John J. Kingman Road, Suite 0944, Ft. Belvoir, VA 22060-6218.

3. The Final Report shall be marked with a distribution statement to denote the extent of its availability for further distribution, release, and disclosure with additional approvals or authorizations. The Final Report shall be marked on the front page in a conspicuous place with the following marking:

DISTRIBUTION STATEMENT B. Distribution authorized to U.S. Government agencies only to protect information not owned by the U.S. Government, or received with the understanding that it is not routinely transmitted outside of the U.S. Government. Other requests for this document shall be referred to the ARL Security and Intelligence Office.